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## NEONATAL ISOERYTHROLYSIS AND THE MULE FOAL

Determine the Potential .....  
Be Prepared!



Neonatal Isoerythrolysis (NI) is a disease of newborn horse and mule foals occurring within the first week of life. It can be a severe life threatening condition that occurs more often in mule foals than it does in horse foals. There is an estimated 10% incidence of NI in mule foals. All donkeys possess the red blood cell antigen known as the donkey factor. Previous donkey/mare breedings may allow a mare to become sensitized to this factor.

NI is caused when the mare produces antibodies against the foal's red blood cells and transfers those antibodies to the foal through colostrums during the first 24 hours of lactation and nursing. This syndrome may occur when the mare becomes sensitized to donkey factor from the red blood cells of the mule foal during pregnancy. Antibodies are produced against the incompatible red blood cells. After ingestion of colostrums, antibodies attach to the factors (antigens) of the foal's red blood cells, and through a series of reactions, cause the foal's red blood cells to rupture (erythrocyte lysis, which describes

the syndrome's medical name, neonatal isoerythrolysis). This is unlike the situation in humans where the antibodies (which most frequently are anti-Rh antibodies) cross the placenta during late pregnancy. In equine pregnancies the antibodies do not cross the placenta, but are transferred through the colostrums.

### Determining the Potential for NI

All mare-donkey breedings have the potential to result in a NI mule foal. We recommend screening the mare's serum for anti-donkey antibodies two to three weeks before foaling, especially multiparous mares. In addition, if the jack's blood (EDTA) is available, crossmatching with the mare's serum will be performed at no extra charge.

### Prevention of NI

The prevention of NI can be accomplished by withholding colostrums from the foal of a mare that has antibodies to red blood cell factors to her foal. The foal should be muzzled and the mare's milk emptied for 24-48 hours under the advisement of a veterinarian. An alternate source of colostrums should be administered to the foal.

### Diagnosis of NI

Clinical signs of red blood cell lysis in the affected foal usually occur within 6-72 hours after birth. The major clinical signs are lethargy, elevated pulse (heart rate), increased respiratory rate, anemia and jaundice. If mild, the foal may recover without treatment, however the disease may progress to severe anemia and organ dysfunction leading to death. Diagnosis is supported by demonstrating anti-

erythrocyte (anti-donkey factor) antibodies in the serum of the mare.

### Samples for testing

2 ml of serum is required for an antibody screen. Allow the blood from a 10 ml red top tube to clot for 30 minutes. Spin and separate the serum into another tube. A serum separator tube can also be used. If available, the jack's whole blood (EDTA or ACD) tube should be sent for crossmatching.

Samples should be stored in a refrigerator until they are ready to be shipped. Samples need to be protected from direct contact with the ice pack. It is best to ship by Federal Express for prompt delivery to our lab.

Cost: \$60 for antibody screen (NI). Please include check payable to VMTH with submission of the sample and form. We also accept Visa or Mastercard (complete credit card portion of submission form).

### Reporting of results

Generally testing is performed within a few days of receiving the sample. Results will be transmitted through FAX or phone.

Send samples to:

Hematology Laboratory, Room 1012, Veterinary Medical Teaching Hospital, One Garrod Drive, University of California, Davis, CA 95616 or contact: 530/7521303 - FAX 530/754-9007 or [email: jnsnipes@ucdavis.edu](mailto:jnsnipes@ucdavis.edu)

For more detailed information or to download a submission form, please see the VMTH website at: [www.vmth.ucdavis.edu/NI](http://www.vmth.ucdavis.edu/NI)